

What is claimed is:

1           1.     A method for transmitting a route request for a route between a source  
2     node and a destination node in an *ad-hoc* network and for transmitting a reply identifying the  
3     route, the *ad-hoc* network including a plurality of nodes including at least one master node in  
4     at least one piconet, said method comprising:

5                 transmitting the route request from the receiving node in the *ad-hoc* network to  
6     the at least one master node of said at least one piconet via a unicast transmission; and

7                 generating a route reply and sending the route reply to the source node, the  
8     route reply identifying the route in the *ad-hoc* network between the source node and the  
9     destination node.

1           2.     The method of claim 1, wherein the route request is received by the  
2     receiving node from another node in the at least one piconet.

1           3.     The method of claim 1, wherein the route request is generated within the  
2     receiving node.

1           4.     The method of claim 1, further comprising the steps of:

2                 (a)     determining, before said step of transmitting, whether the route request  
3     has been previously received at the receiving node; and

4                 (b)     ignoring the route request if it is determined in said step (a) that the route  
5     request has been previously received at the receiving node.

1                   5.     The method of claim 4, wherein the route request is received by the  
2     receiving node from another node in the at least one piconet.

1                   6.     The method of claim 4, wherein the route request is generated within the  
2     receiving node.

1                   7.     The method of claim 1, further comprising the steps of:

2                   (a)     determining, before said step of transmitting, whether the receiving node  
3     is a master node; and

4                   (b)     determining whether the destination node is in the piconet of the  
5     receiving node if it is determined in said step (a) that the receiving node is a master node,

6                   wherein said step of generating a route reply and sending the route reply to the  
7     source node is performed if it is determined in said step (b) that the destination node is in the  
8     piconet of the node, and said step of transmitting is performed if it is determined in said step  
9     (b) that the destination node is not in the piconet of the receiving node.

1                   8.     The method of claim 7, further comprising the step of adding the  
2     receiving node to a route list of a packet containing the route request before said step of  
3     generating a route reply if it is determined in said step (b) that the destination node is in the  
4     piconet of the receiving node.

1                   9.     The method of claim 1, further comprising the steps of:

2 (a) determining, before said step of transmitting, whether the receiving node  
3 is a master node; and

4 (b) determining whether the receiving node is participating in multiple  
5 piconets if it is determined in said step (a) that the receiving node is not a master node,

6 wherein said step of transmitting the route request to a master node of the  
7 receiving node includes transmitting the route request if it is determined in said step (b) that the  
8 receiving node is not participating in multiple piconets.

1 10. The method of claim 9, further comprising the step:

2 (c) determining whether the destination node is in the piconet of the master  
3 node of the receiving node after said step (b),

4 wherein said step of generating a route reply and sending the route reply to the  
5 source node includes generating and sending the route reply if it is determined in said step (c)  
6 that the destination node is in the piconet of the master node of the receiving node, and said  
7 step of transmitting the route request includes transmitting the route request if it is determined  
8 in said step (c) that the destination node is not in the piconet of the master node of the  
9 receiving node.

1 11. The method of claim 10, wherein the step of transmitting the route  
2 request comprises transmitting the route request to master nodes in piconets other than the  
3 piconet from which the route request was received if it is determined in said step (b) that the  
4 receiving node is participating in multiple piconets.

1                   12.    The method of claim 11, further comprising the steps of:  
2                   (i)    determining, before performing said step (a), whether the route request  
3    has been previously received at the receiving node; and  
4                   (ii)   ignoring the route request if it is determined in said step (i) that the route  
5    request has been previously received at the receiving node.

1                   13.    The method of claim 1, further comprising the steps of:  
2                   (a)    determining, before said step of transmitting, whether the receiving node  
3    is a master node; and  
4                   (b)    determining whether the receiving node is participating in multiple  
5    piconets if it is determined in said step (a) that the receiving node is not a master node,  
6                   wherein said step of transmitting the route request includes transmitting the  
7    route request to master nodes in piconets other than the piconet from which the route request  
8    was received if it is determined in said step (b) that the receiving node is participating in  
9    multiple piconets.

1                   14.    A device-readable memory for a communication device, the memory  
2    storing device-readable instructions for transmitting a route request in an *ad-hoc* network and  
3    for generating a route reply identifying the route, the route request being one of received at  
4    and generated by the communication device for a route between a source node and a  
5    destination node in the *ad-hoc* network, the *ad-hoc* network including a plurality of nodes  
6    including the communication device and at least one master node in at least one piconet, said

7 memory comprising device-readable instructions for transmitting the route request from the  
8 communication device in the *ad-hoc* network to the at least one master node of the at least one  
9 piconet via a unicast transmission and for generating a route reply and sending the route reply  
10 to the source node, the route reply identifying the route in the *ad-hoc* network between the  
11 source node and the destination node.

1 15. The memory of claim 14, further comprising device-readable instructions  
2 for determining whether the route request has been previously received at the communication  
3 device before transmitting the route request and for ignoring the route request if it is  
4 determined that the route request has been previously received at the communication device.

1 16. The memory of claim 14, further comprising device-readable instructions  
2 for determining whether the communication device is a master node before transmitting the  
3 route request and for determining whether the destination node is in the piconet of the  
4 communication device if it is determined that the communication node is a master node,  
5 wherein said device-readable instructions for generating a route reply and sending the route  
6 reply to the source node include instructions for generating and sending the route reply if it is  
7 determined that the destination node is in the piconet of the communication device, and said  
8 device-readable instructions for transmitting the route request include instructions for  
9 transmitting the route request if it is determined that the destination node is not in the piconet  
10 of the communication device.

1           17.    The memory of claim 16, wherein said device-readable instructions for  
2   generating a route reply further include device-readable instructions for adding the  
3   communication device to a route list of a packet containing the route request before sending the  
4   route reply if it is determined that the destination node is in the piconet of the communication  
5   device.

1           18.    The memory of claim 14, further comprising device-readable instructions  
2   for determining, before transmitting the route request, whether the communication node is a  
3   master device and for determining whether the communication device is participating in  
4   multiple piconets if it is determined that the communication device is not a master node,  
5   wherein said device-readable instructions for transmitting the route request include instructions  
6   for transmitting the route request to a master node of the communication device if it is  
7   determined that the communication device is not participating in multiple piconets.

1           19.    The memory of claim 18, further comprising device-readable instructions  
2   for determining whether the destination node is in the piconet of the master node of the  
3   communication device, wherein the device-readable instructions for generating a route reply  
4   and sending the route reply to the source node include instructions for generating and sending  
5   the route reply if it is determined that the destination node is in the piconet of the master node  
6   of the communication device, and said device-readable instructions for transmitting the route  
7   request include instructions for transmitting the route request if it is determined that the  
8   destination node is not in the piconet of the master node of the communication device.

1           20.    The memory of claim 19, wherein said device-readable instructions for  
2   transmitting the route request include instructions for transmitting the route request to master  
3   nodes in piconets other than the piconet from which the route request was received if it is  
4   determined that the communication device is participating in multiple piconets.

1           21.    The memory of claim 20, further comprising device readable instructions  
2   for determining whether the route request has been previously received at the communication  
3   device before determining whether the communication device is a master node, and for  
4   ignoring the route request if it is determined that the route request has been previously received  
5   at the communication device.

1           22.    The memory of claim 14, further comprising device-readable instructions  
2   for determining, before transmitting the route request, whether the communication device is a  
3   master node and for determining whether the communication device is participating in multiple  
4   piconets if it is determined that the communication device is not a master node, wherein said  
5   device-readable instructions for transmitting the route request include instructions for  
6   transmitting the route request to master nodes in piconets other than the piconet from which the  
7   route request was received if it is determined that the communication device is participating in  
8   multiple piconets.

1           23.    A wireless communication device for transmitting a route request for a  
2   route between a source node and a destination node in an *ad-hoc* network and for generating a

3 route reply identifying the route, the route request being one of received at and generated by  
4 the device, wherein the *ad-hoc* network includes a plurality of nodes including the device and  
5 at least one master node in at least one piconet, said device comprising a transceiver and a  
6 memory storing device-executable instructions for transmitting the route request to the at least  
7 one master node of the at least one piconet via a unicast transmission and for generating a route  
8 reply and sending the route reply to the source node, the route reply identifying the route in the  
9 *ad-hoc* network between the source node and the destination node.

1           24.    The device of claim 23, wherein said transceiver comprises a Bluetooth  
2 radio.

1           25.    The device of claim 23, further comprising a protocol stack including a  
2 network layer and a link layer, said device-executable instructions comprising a part of said  
3 network layer.

1           26.    The device of claim 25 wherein said network layer comprises a network  
2 block comprising device-executable instructions for *ad-hoc* networking, said device-executable  
3 instructions for transmitting the route request comprising a part of said device-executable  
4 instructions for *ad-hoc* networking.

1           27.    The device of claim 23, further comprising a protocol stack including a  
2 network layer and a link layer, said device executable instructions comprising a part of said  
3 link layer.



1           28.    The device of claim 27, wherein said link layer comprises a Bluetooth  
2   driver with a personal area network profile, said device-executable instructions comprising a  
3   part of said personal area network profile.

1           29.    The device of claim 23, wherein said memory further comprises device-  
2   readable instructions for determining whether the route request has been previously received at  
3   the communication device before transmitting the route request and for ignoring the route  
4   request if it is determined that the route request has been previously received at the  
5   communication device.

1           30.    The device of claim 23, wherein said memory further comprises device-  
2   readable instructions for determining whether the communication device is a master node  
3   before transmitting the route request and for determining whether the destination node is in the  
4   piconet of the communication device if it is determined that the communication device is a  
5   master node, wherein the device-readable instructions for generating a route reply and sending  
6   the route reply to the source node include instructions for generating and sending the route  
7   reply if it is determined that the destination node is in the piconet of the communication node,  
8   and said device-readable instructions for transmitting the route request include instructions for  
9   transmitting the route-request if it is determined that the destination node is not in the piconet  
10   of the communication node.

1           31.    The device of claim 30, wherein said device-readable instructions for  
2   generating a route reply further include device-readable instructions for adding the  
3   communication device to a route list of a packet containing the route request before sending the  
4   route reply if it is determined that the destination node is in the piconet of the communication  
5   device.

1           32.    The device of claim 23, wherein said memory further comprises device-  
2   readable instructions for determining, before transmitting the route request, whether the  
3   communication device is a master node and for determining whether the communication device  
4   is participating in multiple piconets if it is determined that the communication device is not a  
5   master node, wherein said device-readable instructions for transmitting a route request include  
6   instructions for transmitting the route request to a master node of the communication device if  
7   it is determined that the communication device is not participating in multiple piconets.

1           33.    The device of claim 32, wherein said memory further comprises device-  
2   readable instructions for determining whether the destination node is in the piconet of the  
3   master node of the communication device, wherein said device-readable instructions for  
4   generating a route reply and sending the route reply to the source node include instructions for  
5   generating and sending the route reply if it is determined that the destination node is in the  
6   piconet of the master node of the communication device, and said device-readable instructions  
7   for transmitting the route request include instructions for transmitting the route request if it is

8 determined that the destination node is not in the piconet of the master node of the  
9 communication device.

1           34. The device of claim 33, wherein said device-readable instructions for  
2 transmitting the route request include instructions for transmitting the route request to master  
3 nodes in piconets other than the piconet from which the route request was received if it is  
4 determined that the communication device is participating in multiple piconets.

1           35. The device of claim 34, wherein said memory further comprises device-  
2 readable instructions for determining whether the route request has been previously received at  
3 the communication device before determining whether the communication device is a master  
4 node, and for ignoring the route request if it is determined that the route request has been  
5 previously received at the communication device.

1           36. The device of claim 23, wherein said memory further comprises device-  
2 readable instructions for determining, before transmitting the route request, whether the  
3 communication device is a master node and for determining whether the communication device  
4 is participating in multiple piconets if it is determined that the communication device is not a  
5 master node, said device-readable instructions for transmitting a route request including  
6 instructions for transmitting the route request to master nodes in piconets other than the piconet  
7 from which the route request was received if it is determined that the communication device is  
8 participating in multiple piconets.

1                    37.    The device of claim 23, wherein said device comprises a mobile phone.

1                    38.    The device of claim 23, wherein said transceiver is operable for  
2    communication via a Bluetooth protocol.